Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	ET Docket No. 19-138
Use of the 5.850-5.925 GHz Band	)	

COMMENTS

Continental Automotive Systems ("Continental") hereby submits these Comments pursuant to the Commission's Notice of Proposed Rulemaking ("Notice") released on December 17, 2019 in the above-captioned proceeding.[1] Continental requests that Commission action in this proceeding be taken in a manner consistent with these Comments and consistent with preserving human life.

I. Continental's Interest In This Proceeding

Continental is a long-standing Tier 1 supplier that provides Original Equipment Manufacturers (OEMs) with sustainable solutions to enhance automotive safety. In the U.S., Continental employs more than 19,000 people at more than 80 locations across 36 states, and globally it has more than 240,000 employees across 59 countries.

Continental plays an important role in the development of innovative safety, driver assistance, intelligent and automated driving technologies. For more than a decade, Continental has been directly involved in the design and development of connected vehicle technology, with production awards worldwide in both Dedicated Short-Range Communications (DSRC) and Cellular-V2X (CV2X), including in the U.S. market.

[1] "In the Matter of Use of the 5.850-5.925 GHz Band", Notice of Proposed Rulemaking, ET Docket No. 19-138,

Continental has actively developed these technologies for OEMs to use as the foundation of V2V/V2X communications facilitating the exchange of life-saving information about the vehicle's speed, heading, brake status and other crash avoidance parameters. Additionally, Continental has been extremely active in the development of intelligent infrastructure and mobility solutions within the Intelligent Transportation Systems (ITS) ecosystem.

II. The Commission Should Not Reallocate Any of the 75 MHz (5.850-5.925 GHz) Currently Allocated for ITS – Any Such Reallocation Would Result In Many Thousands of Americans Dying and Countless More Incurring Serious Injuries Unnecessarily in this Decade from Preventable Automobile Accidents

A. The Outcome of this Proceeding will Determine Whether Many Thousands of Americans Die and Countless More Incur Serious Injuries Unnecessarily in this Decade from Preventable Automobile Accidents

In the Notice, the Commission states that the goal of its proposals is to "ensure that the American public can reap the utmost utility from the 5.9 GHz band with minimal further delay."[2] There is nothing of greater utility than preserving human life.

While in some frequency ranges it may be appropriate to prioritize the most expedient manner in which to "accommodate[e] the needs of businesses and consumers for fixed and mobile broadband communications…",[3] the spectrum allocation decisions in this particular proceeding must be approached by prioritizing the lives and safety of American citizens rather than facilitating our already substantial access to high speed routers and smart TVs.

This proceeding is about far more than economics, although Continental strongly believes that the economics favor keeping all 75 MHz (5.850-5.925 GHz) allocated for ITS. This proceeding is about preventing traffic accidents and saving lives and avoiding serious injury with automotive safety technology. More than 37,000 die, and more than 2.7 million people are

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FCC 19-129 (rel. December 17, 2019).

[2] Notice at ¶10.

injured (many seriously), each year in motor vehicle accidents in the United States. Most of them are between the ages of 15 and 44. These are numbers that Continental, as an automotive and technology supplier, is tirelessly working to eliminate. Over the years, safety solutions are designed, developed, and introduced into the automotive market to prevent motor vehicle deaths and accidents from happening. As technology has evolved, so has the safety solutions and products. Driver education, while valuable, is insufficient as it does not provide the needed guidance in the vehicle at the moment it is needed. Drivers who obey all traffic rules and are as careful as possible are at risk from other drivers who do not pay enough attention. Human mistakes will always happen. But the tragedy of the situation is that when the industry is on the verge of using technology to help alleviate these situations, that technology may be blocked based on commercial value to non-safety-related unlicensed wireless devices.

To help avoid unnecessary American deaths in automobile accidents in this decade and countless more needlessly suffering serious injuries, the Commission in this proceeding must ensure that it does not prevent any currently-available vehicular safety technology from being deployed and that it also does not prevent any soon-to-be available vehicular safety technology from being deployed as soon as reasonably practicable.

Consistent with its statutory mandate to protect public safety,[4] the Commission must not reallocate any, let alone most, of the 5.9 GHz band to unlicensed operations, and must instead preserve and protect both existing automotive safety technologies and human life. To accomplish this, the Commission must also ensure the prompt development of critical future automotive safety technologies by continuing to allocate all 75 MHz of the band (5.850-5.925

[3] Id. at ¶13.

[4] "Congress created the Commission for the purpose of, among other things, 'promoting safety of life and property through the use of wire and radio communications.' 47 U.S.C. § 151. So the Commission is 'required to consider public safety by * * * its enabling act.' Nuvio Corp. v. FCC, 473 F.3d 302, 307 (D.C. Cir. 2006); see also 47 U.S.C.

GHz) for ITS. Any other ruling in this proceeding will be a setback to automotive safety for all Americans over this decade and would significantly limit the number of safety applications that would be deployed to avoid motor vehicle accidents and deaths. Continental estimates tens of thousands of lives are at risk over the next decade if the Commission chooses to reallocate spectrum in this band away from ITS Failing to act to prevent these deaths, and countless other serious injuries, would be unconscionable. As a company dedicated to automotive safety, we strongly believe the ruling of the Commission here will significantly impact the safety of all motor vehicle users in the U.S. for years to come.

B. The Full 5.9 GHz Band Must Be Preserved for ITS, In Order to Avoid Limiting The Automotive Industry from Employing Vehicular Safety Technologies That Are Designed To Decrease Automobile Deaths And Injuries Over the Next Decade

To prevent the needless deaths and serious injuries discussed above, advanced automotive safety technologies must have sufficient bandwidth allocated to them. All application-driven bandwidth estimations performed by CAMP, C2C-CC, 5GAA, ACEA and CLEPA demonstrate that automotive safety applications for V2X require *at least* 70 MHz of cumulative bandwidth regardless of the communication technology utilized or the types of messages.[5] An additional 5 MHz guard band is required at the edges of the 5.9 GHz range to mitigate potential harmful interference. The anticipated frequency requirements for advanced automotive safety applications is shown below, based on available public data:

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§ 615…" Mozilla Corp. v. FCC, No. 18-1051, p. 93 (D.C. Cir. Oct. 1, 2019).

[5] See e.g., C2C-CC Position Paper "Road Safety and Road Efficiency Spectrum Needs in the 5.9 GHz" (accessed at https://www.car-2-car.org/fileadmin/documents/General_Documents/C2CCC_TR_2050_Spectrum_Needs.pdf); ETSI TR 103 562 "Intelligent Transport Systems (ITS); Vehicular Communications; Basic Set of Applications; Analysis of the Collective Perception Service (CPS); Release 2" (accessed at: https://www.etsi.org/deliver/etsi_tr/103500_103599/103562/02.01.01_60/tr_103562v020101p.pdf);

Safety spectrum needs for a single short-range V2X communication technology in MHz bandwidth, in 5.9 GHz safety band

	environment		
message type	**urban**	**suburban**	**Rural** (Highway) light traffic, high speed
BSM Basic Safety Message	9	10	9
SPAT signal phase and timing**, MAP** road/lane topology and traffic maneuver **, IVI** in-vehicle-information and other **I2V messages**	1	1	1
PSM personal safety message	4	1	2
PCM platooning control message	3	6	10
CPM collective perception message	23	26	24
MCM maneuver coordination message	23	26	24
Minimum basic spectrum needs in MHz for safety	**63**	**70**	**70**
number of 10 MHz channels required	**7**	**7**	**7**

Sufficient bandwidth is not optional, or nice-to-have, it is essential to automotive safety in this context. Without sufficient bandwidth, some of these technologies will be very limited in what they can accomplish; others will be rendered completely useless. The primary losers from such a ruling would not be the automobile industry – it would be Americans across the country whose lives are cut dramatically short, and the decedents' loved-ones and close friends.

Continental as a safety supplier is working to make "vision zero" a reality. To reach that goal, 75 MHz of ITS spectrum is a necessary pre-condition. V2X technology, with sufficient operational bandwidth, is essentially an evolution in crash avoidance in which it provides the driver with prompt warnings of likely crash conditions. NHTSA estimates V2X has the potential to reduce the number and severity of motor vehicle crashes by up to 80 percent.[6]

If ITS is limited to 30 MHz in this band, non-line-of-sight automotive safety technologies will be severely hampered. In the United States, nearly half of all crashes, and more than a

quarter of all fatal crashes, occur at intersections. Furthermore, about one-third of Americans who die from traffic fatalities are not driving a vehicle at the time, and they are not even passengers in the car. They are pedestrians. The reason so many pedestrians are killed, and, for that matter, the reason that so many people driving or riding in vehicles are killed on the road today, is because the vehicular safety technologies currently in place are line-of sight technologies that do not help overcome human error where non-line of sight technologies are necessary. Motor vehicles with line-of-sight based systems like radar and camera can have limitations, inherent to the system. These limitations are: Non-line-of sight hazards are not detectable; driver intentions are not always recognizable; and position/speed recognition is in some cases insufficient. All these limitations can be addressed with V2X communication. For non-impaired accidents line of sight technologies can only help in about 40% of the cases; in the other approximately 60% non-line of sight vehicular technologies are needed.[7]

Moreover, if ITS is limited to 30 MHz in this band, the following technologies that are either currently available or will soon-be-available will be either undermined or rendered useless (and research and development in these areas will be substantially chilled):

- Truck platooning and vehicle platooning if the 30 MHz band is limited by interference or spectrum split for different communication technologies
- Sensing driving with collective perception (CPM collective perception message)

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[6] See; http://www.nhtsa.gov/DOT/NHTSA/NVS/Crash%20Avoidance/Technical%20Publications/2010/811381.pdf

[7] Any realistic analysis of the frequency requirements for advanced vehicular safety technologies must take into account the fact that an estimated 60% of serious and fatal intersection accidents cannot be mitigated by today's Advanced Driver Assistance System (ADAS) (In-Vehicle Perception: radar, camera, LiDAR) technologies alone. Continental study based on data from GIDAS in depth accident database (https://www.gidas.org/en/about-gidas/ueberblick-ueber-gidas/); German Federal Statistical Office (DESTATIS), 2016. Fatality Analysis Reporting System (FARS), 2015. UMTRI Research, 2015 GES.

- Vulnerable Road User (like pedestrians, bicycles, motorcycles) Protection for non-V2X-equipped VRU´s
- Motorized road user protection for non-V2X equipped vehicles
- Overtaking Warning with collective perception
- Extended Intersection Collision Warning with collective perception

- Cooperative Adaptive Cruise Control (CACC)
- Intention sharing; and
- Cooperative automated driving with coordinated maneuvering (MCM maneuver coordination message)
  - Cooperative Lane Change
  - Cooperative Overtaking
  - Maneuver coordination for automated driving

C. Introduction of WI-FI / unlicensed devices into the Spectrum

To make matters worse, even the current benefits that Americans get today from vehicular safety technologies in the band will be largely wiped away if the Commission adopts its tentative conclusions. Testing has indicated that allowing unlicensed devices to operate in the spectrum contemplated by the Commission will cause interference with the vehicular safety technologies in the adjacent bands, preventing them from properly operating, leading to unacceptable packet error rates of up to 70% and above for V2X safety communication.[8] To avoid harmful interference, Continental supports a -40 dBm/MHz out-of-band emissions limit at the band edges of 5.855-5.925 GHz.

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[8] Source "Vehicle-to-Vehicle Communications Research Project (V2V-CR)
DSRC and Wi-Fi Baseline Cross-channel Interference Test and Measurement Report" by US DoT, 12/2019, https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/documents/v2v-cr_dsrc_wifi_baseline_cross-

D. International Recommendations and Actions by Other Countries Further Support Continental's Position

While the Commission in the Notice attempts to justify its proposal to risk the safety of the American public by referencing the ITS spectrum allocations for some other countries,[9] such rationale ignores the most recent and reliable recommendations by WRC 2019 in conjunction with ITU-R recommendation for ITS for international harmonization of 70 MHz ITS spectrum at 5850-5925 MHz.[10] In fact, Canada, Australia, Singapore, South Korea, Russia, United Arab Emirates and several European counties have already dedicated to vehicular safety technologies about the same amount of spectrum that ITS currently has in this band in the U.S. E.U. (EU) regulation (Commission Decision 2008/671/EC and Commission Implementing Decision (EU) 2019/1345) is currently being revised for extending the frequency band at 5.9 GHz from 50 MHz to 70 MHz for cooperative ITS. However, many member states of EU have already a 70 MHz designation that has followed from work within CEPT (ECC decision (08)0) and ECC recommendation (08)01). Japan has so far dedicated less, though now realizes that is far too little and is in the process of planning to allocate around the same amount as is currently dedicated by the Commission in this band to ITS. Reserving the full 75 MHz range for ITS will ensure that the United States will remain at the global forefront of automotive safety technology and ultimately reduce the number of traffic fatalities and injuries.

E. Reducing ITS to only 30 MHz in this Band will Set Back Consumer Safety by Many Years

If the Commission reduces ITS to only 30 MHz in this band, it will take many years, at the very least, to implement the technologies that can save so many lives and prevent so many

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channel_interference_test_report_pre_final_dec_2019-121219-v1-tag.pdf

[9] Notice at ¶21.

[10] WRC recommendation 209 on page 555 in https://www.itu.int/en/ITU-R/conferences/wrc/2019/Documents/PFA-WRC19-E.pdf and ITU-R recommendation M.2121-0

injuries. The automotive industry has made significant progress over the years developing ITS safety applications that will function consistently in challenging environmental and real-world conditions. This requires reliable standards for safety purposes that other technology or software developers do not typically have to adhere by. As mentioned before, these take time, money, and research to develop in the automotive industry. The removal of 45 MHz would not only negate billions of dollars spent by industry and government combined to deploy a V2X network per its spectrum allocation, it will also – at best – delay by many years the deployment of critical automotive safety technology.

IV. Conclusion

The United States was among the first in the world to identify V2X as a key technology for saving lives. It was second in the world for launching V2X in production vehicles. But this latest proposal sounds an ominous warning: instead of maintaining our leadership, the United States could fall behind over 30 other countries in the capability to roll out advanced safety functionality. Behind the European Union. Behind Korea. Behind Canada. Even Behind Mexico and Russia. When it comes to saving American lives, we should clearly strive to be the global leader.

Respectfully submitted,

CONTINENTAL

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